

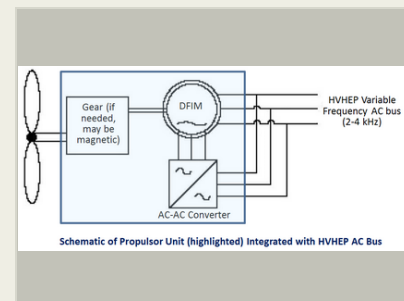
Mega-Watt Class High Voltage, Variable Frequency, Propulsor Power Unit, Phase I

Completed Technology Project (2016 - 2017)



Project Introduction

Balcones Technologies, LLC (BT) proposes to adapt technologies developed by and resident in BT and The University of Texas at Austin Center for Electromechanics (CEM) in the area of advanced high efficiency, high-power density motors/generators and propulsion power train systems to address SBIR 2016 Subtopic T15.01 Power Systems for Hybrid Electric Propulsion. In particular, our team will develop new aircraft propulsor technology that: (1) Is critical for success of the NASA High Voltage Hybrid Electric Propulsion (HVHEP) program, which in turn, directly addresses the NASA Aeronautics Research Mission Directorate Strategic Thrust 3 (Mid and Far Term Ultra-Efficient Commercial Vehicles) and Strategic thrust 4 (Mid and Far Transition to Low-Carbon Propulsion); (2) Is initially focused on Small Single Aisle (SSA) aircraft (100-150 passengers), which accounts for approximately one third of fuel consumed by commercial aircraft, but is scalable to larger aircraft as well; (3) Is a megawatt class propulsor, compatible with distributed propulsion concepts; (4) Interfaces with the HVHEP high frequency variable AC prime power bus concept, but could also be adapted for other types of power buses; (5) Optimizes a propulsor system topology consisting of power electronics, propulsion motor and possibly magnetic gears; (6) Directly addresses potential control and frequency mismatch issues arising from the minimalist use of power electronics in HVHEP variable AC power bus architecture and allows improved optimization of size, frequency, and efficiency for the aircraft overall prime power system and propulsor systems; (7) Is compatible with or can be adapted to the use of propellers and ducted fans with or without blade pitch control; (8) Exploits core technical strengths of both BT and CEM in optimization of controlled electromechanical systems, high performance motors and generators, magnetic gears, and analysis and simulation of these system



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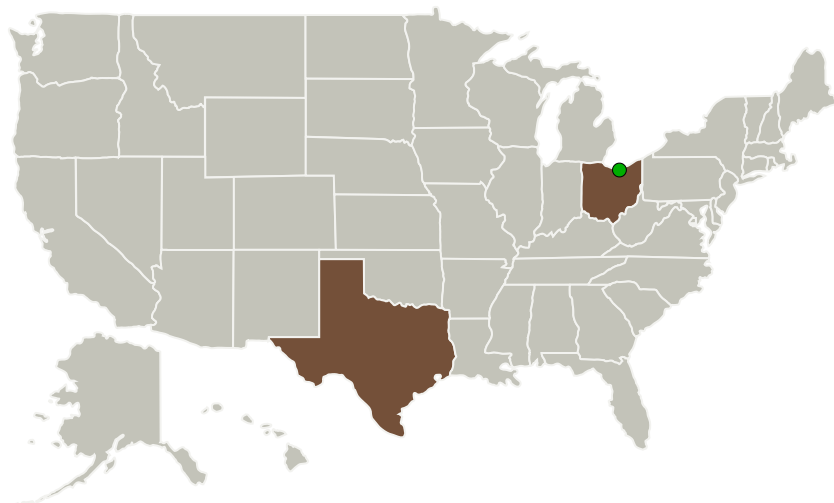
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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Balcones Technologies, LLC	Lead Organization	Industry	Austin, Texas
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio
University of Texas - Center for Electromechanics	Supporting Organization	Academia	Austin, Texas

Primary U.S. Work Locations

Ohio	Texas
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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Balcones Technologies, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

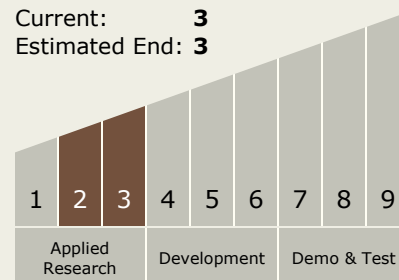
Carlos Torrez

Principal Investigator:

Joseph H Beno

Technology Maturity (TRL)

Start: 2
Current: 3
Estimated End: 3

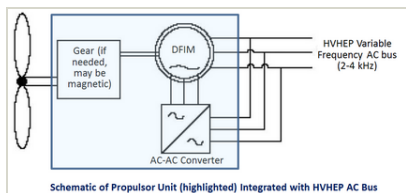


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Images



Briefing Chart Image

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Power Unit, Phase I

(<https://techport.nasa.gov/image/127933>)

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.2 Energy Storage
 - └ TX03.2.3 Advanced Concepts for Energy Storage

Target Destinations

The Sun, Earth, The Moon,
Mars, Others Inside the Solar
System, Outside the Solar
System